

REMARKS/ARGUMENTS

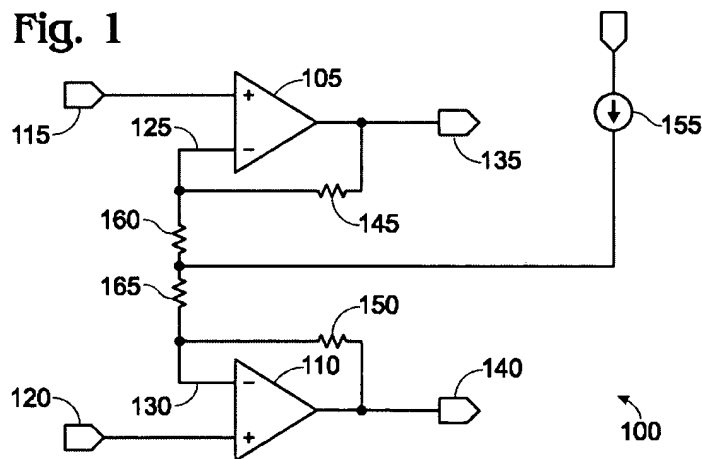
Claim Rejections – 35 U.S.C. § 102

The Examiner has rejected claims 1-4, 9-11, 21, 25 and 26 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,507,223 to Felder. This rejection is respectfully traversed.

Claim 1 recites:

A circuit comprising:
a differential amplifier; and
a direct current (DC) source coupled with the differential amplifier,
wherein a direct current generated by the DC source is communicated in substantially predetermined portions to plural inverting input terminals of the fully-differential amplifier so as to shift a common-mode voltage of one or more electrical signals processed by the fully-differential amplifier by a substantially predetermined amount.

A circuit in accordance with an embodiment of claim 1 is illustrated in Figure 1 of the application, which is presented below for the Examiner's convenience.



As may be seen in Figure 1, a current source 155 is coupled with the inverting inputs 125 and 130 of the amplifiers 105 and 110, respectively, via the resistors 160 and 165.

The Examiner asserts that this element of claim 1 is taught by an adjustable reference module 16, as is illustrated in Figure 1 of Felder. Applicant respectfully disagrees with this assertion of the Examiner. The adjustable reference module 16 of the circuit disclosed in Felder

is a reference voltage source, not a current source. The adjustable reference module 16 is described, for example, in column 2, lines 30-32 of Felder, which states, "As shown, the adjustable reference module 16 produces an adjustable reference voltage 24 ..." Those of skill in this area would appreciate that the use of a voltage source does not teach a current source. As is defined in *Electric Circuits*, James W. Nilsson, page 15, © 1983 Addison-Wesley Publishing Company, Inc., a current source is a circuit element that maintains a prescribed current within its terminals regardless of the voltage across its terminals. In contrast, *Electric Circuits*, on page 15, defines a voltage source as a circuit element that maintains a prescribed voltage across its terminal regardless of the current within its terminals. Thus, a current source performs exactly the opposite function of a voltage source. Specifically, a current source maintains a constant current independent of voltage, while a voltage source maintains a constant voltage independent of current.

Because Felder does not teach, disclose or describe a circuit that includes a current source as is recited in claim 1, Felder does not anticipate claim 1. Thus, the rejection of claim 1 should be withdrawn.

Claims 2-4, 9 and 10 depend from claim 1 and include all of its limitations and the limitations of any intervening claims. Therefore, these claims are patentable over Felder on the same basis as claim 1, and the rejection should be withdrawn.

Claim 11 recites:

A fully differential amplifier circuit comprising:
a first operational amplifier having a first non-inverting input terminal, a first inverting input terminal and a first output terminal, wherein the first output terminal is coupled with the first inverting input terminal via a first resistor of a first resistance value;

a second operational amplifier having a second non-inverting input terminal, a second inverting input terminal and a second output terminal, wherein the second output terminal is coupled with the second inverting input terminal via a second resistor of substantially the first resistance value, and the first and second inverting inputs are coupled via a third resistor and a fourth resistor coupled in series, the third and fourth resistors both being of a substantially same second resistance value; and

a direct current (DC) source having a current output terminal coupled with, and between the third and fourth resistors, the DC source providing a direct current for shifting a common-mode voltage of one or more electrical signals processed by the fully differential operational amplifier.

Claim 11, in like fashion as claim 1, also recites a direct current source that is coupled with resistors that are in turn coupled with the two inverting inputs of a fully differential amplifier. Therefore, claim 11 distinguishes from Felder on the same basis as claim 1, and the rejection should be withdrawn.

Claim 21 recites:

A method of shifting a common-mode voltage comprising:
applying a first differential signal to a first non-inverting input of a differential amplifier;
applying a second differential signal to a second non-inverting input of a differential amplifier, wherein the first and second differential signals have a first common-mode voltage;
generating a substantially fixed direct current;
communicating the substantially fixed direct current to the first and second inverting inputs of the differential amplifier in substantially fixed proportions;
producing first and second differential output signals having a second common-mode voltage, wherein the second common-mode voltage differs from the first common-mode voltage by a voltage amount proportional to the substantially fixed direct current.

Claim 21 recites a method for shifting a common-mode voltage that may be implemented using a circuit in accordance with claim 1 or claim 11. Specifically, claim 21 recites “generating a substantially fixed direct current” (e.g., with a current source) and “communicating the substantially fixed direct current to the first and second inverting inputs of the differential

amplifier in substantially fixed proportions.” Because the adjustable reference module 16 of Felder is a voltage reference module, Felder would generate a substantially fixed voltage, not a substantially fixed current. Thus, claim 21, for similar reasons as claims 1 and 11, is not anticipated by Felder, and the rejection should be withdrawn.

Claims 25 and 26 depend from claim 21 and include all of its limitations. Therefore, these claims are patentable over Felder on the same basis as claim 21, and the rejection should be withdrawn.

Allowable Subject Matter

The Examiner has indicated claims 5-8, 12-20, 22-24, 27 and 28 as being allowable if rewritten in independent form. Applicant thanks the Examiner for this indication of allowability. However, Applicant has chosen not to rewrite these claims and, instead, submits the foregoing arguments for allowance of all pending claims.

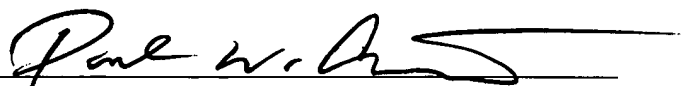
Conclusion

In view of the foregoing, all of the pending claims are in condition for allowance. If the Examiner has any questions, he is invited to contact the undersigned at (360) 379-6514. An early allowance of all the claims is respectfully requested.

Respectfully Submitted,

McDonnell Boehnen Hulbert & Berghoff LLP

Date: Jan. 3, 2005

By: 
Paul W. Churilla
Reg. No. 47,495